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BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an illustration of a portion of a power miter saw with the invention installed on the frame.

Fig. 2 is an illustration of a portion of a power compound miter saw with the invention installed on the frame.

Fig. 3 is an illustration of a portion of a radial arm saw with the invention installed on the frame.

Fig. 4 is an exploded perspective illustration of the marking and illuminating device.

Fig. 5 illustrates a side view of a portion of the light assembly enlarged to more adequately illustrate the configuration of a light beam spreading lens or a light beam fanning lens.

Fig. 6 shows an enlarged view of the first surface of the light beam spreading or fanning lens in a left perspective view.

DETAILED DESCRIPTION OF THE BEST MODE OF THE PREFERRED EMBODIMENTS OF THE INVENTION AS CONTEMPLATED BY THE INVENTOR

Initially referring to Fig. 1 of the drawings, the power miter saw 10 is illustrated with the invention mounted thereon.

The stage 12 of the deck 14 of the power miter saw 10 is set to make a cut near an end 16 on a workpiece 18. The stage 12 of the deck 14 is rotated to a preselected angle and locked into position. The external box 20 containing the illumination assembly (not shown) is attached to the

frame 22 of the stage 12 of the miter saw.

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saw teeth 47. Thus, an illuminating device contained within box 20 projects a fanned line of light 160 co-planer with the saw blade 46.

The illumination box 20 is provided witth an opening 100 from which the fanned light beam 24 as shown in Fig. 1 may project. This aperture 100 is closed to the outside conditions by a glass or transparent plate 102 installed in the end of the illumination box 20 adjacent opening 100.

Follower nut 92 is provided with a blind hole 104 formed in its front face 106 and having an opening 108 extending to the surface 110 of follower nut 92. Alignment collar 112 surrounds collar 122 which, in turn, surrounds laser 114 and the outer end of inner collar 118. The blind hole 104 is sized to permit the alignment collar 112 or orientation barrel 112 to slide into the blind hole 104.

The laser 114 and its attached supporting electronics 116 are positioned to align with collar 118 which has a focusing lens 120 permanently lodged on or within the collar 118. The laser 114 is inserted within the collar 118 and moved axially to the collar 118. This movement can be observed as changing the focus of the laser light 154 such that a spot 152 of light emanating from the focusing lens 120 grows or diminishes as the movement occurs. The spot of light 152 is adjusted by an "in-or-out" movement of the laser 114 to focus and then de-focus the spot of light 152 relative to lens 130 until the spot of light 152 is the proper size.

The spot size of the laser beam 154 is sized to 4.5 mm or 4.25 mm depending upon the width of a saw blade 13, 46, 66 used on the appropriate saw 10, 30, 60. The spot 152 size of the laser beam 154 may be set to any width desired, depending upon the width of the kerf 25 formed by a blade 13, 46, 66. The width of the saw blade 13, 46, 66 is the width of the teeth 26, 37, 67 or the set of the teeth 26, 37, 67 measured perpendicular to the plane of the saw blade 13, 46, 66. Alternatively, saw blade 13, 46, 66 may be used to cut kerf 25 measured from edge to edge.

In all instances, the illumination assembly 80 should be positioned so that the laser light assembly 124 may be moved perpendicular to the plane of the saw blade 13, 46, 66 by the lead screw 82.

Once the spot 152 of light is determined to be the proper size, 4.5 mm or 4.25 mm or another

desired width, the laser 114, attached collar 118, and focusing lens 120 are potted or adhered to the interior of the barrel 122 by the use of a silicone adhesive or other type adhesive. This fixes the spot 152 size. Barrel 122 provides an external surface which fits within orientation barrel 112.

The laser light assembly 124 is now ready to be inserted into the orientation barrel 112. The orientation barrel 112 is provided with a widening or fanning lens 130, and the lens 130 is potted or adhered with a silicone or other adhesive to the orientation barrel 112. Barrel 112 is connected or encircled with an arm 132 which is provided to permit rotation of the barrel 112 and lens 130. Arm 132 provides an easy manually engageable member to use in order to rotate the barrel 112 and, in turn, rotate the line or fanned light beam 24 that emanates from the widening lens 130.

A spot of light 150 is an illuminated area 152 which is illuminated by a collimated light source 154 such as a laser. The spot of light 150 is substantially of uniform dimension in terms of length and width, or diameter.

A line of light 160 is formed from a spot of light 150 so that the line of light is an illuminated region of light having a substantially uniform width dimension and a substantially elongated length dimension, when compared to the width dimension.

The light emanating from a laser such as the laser 114 is passed through a focusing or collimating lens 120 and forms a light spot 150 or spot of light 150 having a small but substantially uniform diametral dimension.

The light spot 150 formed by the collimating lens 120 is then impinged upon the first surface of lens 130. The small spot of light 150 is formed on the first surface 129 of lens 130, which causes the spot of light 150 to be elongated substantially, and thereby form a line of light 162.

The fanning of the light beam 44 from the collimated spot of light 150 impinged upon the first

surface 129 of the lens 130 and forms a fanned line of light rays 162. The fanned line of light rays 162 is then impinged upon the work surface to cause the line of light or beam 162 to indicate the location and width of the kerf 25 by the line of light 160 to be formed by the saw blade 13 as the saw blade 13 cuts through the workpiece 16.

The line of light 160 may be positioned to be co-incident with the kerf 25 formed in the workpiece 16 by rotating the lens 130 to cause the spot of light 150 to be fanned or spread into a line of light 160 and orienting at a different angle to be coincident with the kerf 25 to be formed by the saw blade 13.

This rotational movement of the fanned light beam 162 is accomplished by rotating the lens 130 to cause the fanned light beam 162 from lens 130 to likewise rotate relative to the workpiece 16 and the kerf 25. This rotation of the lens allows the positioning of the line of light 44 that is formed when the fanned light beam 162 to illuminates a narrow band of the workpiece 16.

Accordingly, the light emanating from the lens 130 will form a fan of light162 which, when intercepted by the workpiece 16, can be aligned with the kerf 25. The fan of light162 may be moved by a lateral translation device comprising a block 100 with hole 90 interacting with lead screw 82 to translate the block 100 and lighting assembly 124 parallel to the lead screw 82; additionally the light fan 162 emitting from lens 130 can be moved by handle 112 to further align the light line 160 with the kerf 25 formed by the rotating saw blade 66. The rotation of lens 130 causes the rotation of the spread or fanned light line 162 because the spreading or fanning of the light beam 44 shown in Fig. 5 is perpendicular to the sinusoidal surfaces 129 of the lens 130. The fanning of the light beam 154 is accomplished in only one dimension due to the formation of the lens and will be stationary with respect to the lens 130.

In Fig. 5, which is a partial view of the light assembly 124, showing the collar 122 and lens 130 together with alignment collar 112 and alignment lever 132, the lens 130 illustrates the sinusoidal facial surface configuration 129 of the first surface of the lens 130 and its relationship

to the light beam 44 from the laser 116.

Collars 122 and 112 hold the lens 130 within the collar 112.

The lens 130 is shown in edge view, enlarged to illustrate the surface of the lens 130. Lens 130 is a lens of special shape and may be constructed of an optical plastic which is moldable. The lens 130 is formed with a surface which incorporates a plurality of ridges which extend perpendicular to the light line 162 formed by the fanned beam of light162. The beam of laser light 154 passes through the lens 130 and the sinusoidal ridges 140 and valleys 141 across the lens 130. The number of ridges 140 on the first surface of lens 130 may vary depending upon the size of the spot of light impinging on the lens 130 and the size of the lens 130 and the number of sinusoidal undulations 140, 141 of the lens surface129.